

surface of the earth generally consist of a rapid alternation of descending currents moving under the influence of upper isobars and ascending currents moving under the influence of sea-level isobars. At night time this vertical interchange is less important, and may even cease altogether. The result is a diurnal and reciprocal periodicity in the strength of the sea-level wind and of the currents at the lower cloud level, the latter being stronger in proportion as the former is weaker, as has been explained by Espy and Koeppen. There must also be a diurnal periodicity in the relation of the upper and lower isobars to the direction of the upper and lower currents, respectively. The currents at the level of cumulus clouds should be inclined to the upper isobars at a greater angle at the time of most active vertical interchange, say 2 p. m., and at a less angle at the time of minimum sea-level temperatures, say 6 a. m., but the Editor is not aware that observations are at hand to test the truth of this deduction.

MOVEMENTS OF CENTERS OF HIGH AND LOW BAROMETER DURING 1895.

The location of an area of high or low pressure is, to a limited extent, affected by the method adopted in the reduction of the barometer to sea level. The following summary, therefore, holds good, especially in connection with the method adopted by the Weather Bureau for the past few years. The average daily and hourly movements of the centers of the areas are given by paths and by days in the individual tables of the successive MONTHLY WEATHER REVIEW, and the monthly sums are collected together in the following table for the purpose of taking the annual means by paths and by days.

Movements of areas of high and low barometer for 1895.

Month.	High areas.				Low areas.			
	By paths.		By days.		By paths.		By days.	
	No.	Movement.	No.	Movement.	No.	Movement.	No.	Movement.
		<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>		<i>Miles.</i>
January.....	11	10,409	28.5	25,000	15	10,326	46.0	29,400
February.....	12	7,341	37.0	21,050	17	10,457	43.5	26,400
March.....	11	7,041	41.5	24,150	18	12,756	46.5	32,300
April.....	10	5,314	65.0	33,390	14	8,971	66.5	40,500
May.....	6	3,142	19.0	10,300	8	4,185	29.5	15,450
June.....	4	2,393	24.5	14,558	4	1,893	17.5	7,890
July.....	11	5,168	38.0	16,670	11	5,711	42.5	21,890
August.....	14	6,323	43.0	20,490	17	9,077	62.0	28,920
September.....	9	4,683	43.0	21,520	9	5,276	36.0	20,920
October.....	11	6,765	46.0	23,510	15	9,364	50.5	30,850
November.....	4	2,087	37.5	18,950	10	8,199	31.5	17,470
December.....	3	1,457	12.0	5,915	14	10,525	46.5	32,980
Sums.....	106	62,073	434.0	241,393	152	96,709	509.5	304,800
Mean daily velocity.....	585		556		636		598	
Mean hourly velocity.....	24.4		23.2		26.5		24.9	

TEMPERATURE.

The mean annual temperature is shown by the isotherms on Chart I. These temperatures relate to the surface of the ground. The individual figures are given in Table I of data for Weather Bureau stations. The lowest annual averages within the United States were: St. Vincent, 35.3; Moorhead, 38.5; Sault Ste. Marie, 38.6; Williston, 38.9; Duluth, 39.1; Havre and Bismarck, 39.8. The highest averages were: Key West, 75.9; Jupiter, 72.8; Yuma, 72.4; Tampa, 70.9.

The mean annual temperature was above the normal in New England and in the Missouri Valley, elsewhere it was below the normal; the regions of large deficits were the east and west Gulf States.

The maximum temperatures are shown both by the upper figures and full lines on Chart II; the minimum temperatures of the year are shown by the lower figures and the dotted lines on the same chart. The absolute range of temperature during the year is easily obtained by comparing the full and dotted lines on this chart. In general, maximum temperatures exceeding 100°, occurred as follows: 102, Columbia, S. C., Omaha, and Independence; 103, San Antonio, Tex., Sioux City, and Huron; 104, Walla Walla; 106, Pierre; 108, Red Bluff; 110, Fresno; the absolute maximum for the whole country was 114 at Yuma.

Minimum temperatures of 35° or less occurred at Bismarck, —39; Williston, —40; St. Vincent, —41; the absolute minimum for the whole country was —41° at St. Vincent.

The region of large annual ranges of temperature were: Upper Lake, Upper Mississippi and Missouri Valleys, the Dakotas, northern and middle Slopes.

The small annual ranges were: Key West, 42; Point Reyes Light, 49.

The accumulated departures of average monthly temperatures are given in Table III, and show that there was a steady increasing deficit throughout the year over the lower Lakes, Atlantic and Gulf States, as also over the northern, middle, and southern Rocky Mountain Slopes, and the northern, middle and southern Pacific Slopes. A diminishing deficit amounting to an excess in some places prevailed in the upper Lake Region, North Dakota, the Mississippi and Missouri Valleys.

PRECIPITATION.

The total annual fall of rain and melted snow for 1895 is shown on Chart III. The greatest precipitation was Tatoosh Island, 92.95; East Clallam, 90.35; Jupiter, 70.47; Astoria, 70.75; the least was 1.33 at Yuma, 4.17 at Independence, and 6.84 at Winnemucca.

An annual rainfall above 60 inches occurred at Hatteras, Jupiter, East Clallam, Fort Canby, Pysht, Tatoosh Island, and Astoria.

An annual rainfall of less than 20 inches prevailed in North Dakota, the northern part of the Missouri Valley, and generally over the northern and middle Slope, the Southern, middle, and northern Plateau, and the south Pacific Coast regions.

The accumulated departures of total monthly precipitation from the normal values are shown in Table IV, from which it appears that a steadily increasing deficit has prevailed in all regions except Florida, the southern Slope, and southern Plateau. The larger accumulated deficits were: Ohio Valley and Tennessee, 11.00; middle Atlantic, 9.10; upper Mississippi, 7.80; east Gulf, 8.60.

WIND.

The prevailing direction of the wind, namely, that which occurred most frequently at the two hours of regular observations for telegraphic report, 8 a. m. and 8 p. m., eastern time, is given in Table I. The annual resultant wind deduced from these same observations without taking account of the force of the wind (which is equivalent to attributing a uniform force to all winds) is given in table V. These resultants are also presented graphically on Chart I in connection with the barometric means. They should also be compared with the pressures on Charts IV and V to which they are intimately related.

Owing to the great labor of computation the resultant winds, as deduced from hourly readings of the self-registering anemometers, have not been computed during the year 1895, but the relation between the resultants from two observations per day and those from twenty-four hourly observations can be estimated by a comparison between Tables V and VI, pp. 544 and 545 of the Summary for 1894.

MOISTURE.

The mean temperature of the dew-point and the mean relative humidity are given in Table I.